WHAT IS CLAIMED IS:

1. A method of early fault detection in a centrifugal pump equipped with a balancing device which comprises an axial gap through which a balancing flow is conducted, and with a balancing device spring element which is deformed by axial thrust of the pump and acts upon the balancing device to oppose complete closure of the axial gap; said method comprising measuring the deformation of the spring element during operation of the centrifugal pump, and starting from the pump characteristic curve of the centrifugal pump and the spring constant of the spring element, drawing a conclusion regarding the current operating state of the centrifugal pump based on the measured deformation.

2. A method according to claim 1, wherein said balancing device further comprises at least one radial gap.

3. A method according to claim 1, wherein baseline measurements are taken for each type of centrifugal pump which is to be monitored for early detection of pump faults and for the medium which is to be pumped; said baseline measurements relating the axial force, the balancing force and the pressure distribution within the impeller chamber to operating points on the characteristic curve of the centrifugal pump.

4. A method according to claim 1, wherein for each type of centrifugal pump which is to be monitored for early detection of faults and for the medium which is to be pumped, a dynamic measurement which determines the frequency spectra of the spring element is taken to detect frequency bands that are associated with the pumped flow and to indicate possible faults in the centrifugal pump.

5. A method according to claim 1, wherein axial thrust in the direction of the delivery side of the centrifugal pump is monitored or

measured via a further spring element which is arranged in opposite direction to said balancing device spring element.

6. A method according to claim 1, wherein incipient bearing wear is detected.

7. A method according to claim 1, wherein approaching contact between rotor and housing of the centrifugal pump is detected.

8. A method according to claim 1, wherein impermissible cavitation conditions are detected.

9. An apparatus for early detection of faults in a centrifugal pump equipped with a balancing device which comprises an axial gap through which a balancing flow is conducted and with a spring element which is deformed by an axial thrust of the pump and acts upon the balancing device to hold open the axial gap; said apparatus further comprising means for measuring the deformation of said spring element and correlating the measured deformation with the operating state of the pump.

10. An apparatus according to claim 9, wherein said spring element is a cardanic ring which is dimensioned such that it is deformed by a residual axial force defined by the configuration of the balancing device to adjust the axial gap to a prescribed value.

11. An apparatus according to claim 9, wherein said balancing device comprises at least one radial gap.